

Patent Claims

1. An appliance (10) of personal use such as a toothbrush, an oral irrigator, a shaver, a kitchen machine, with a driving mechanism constructed as an electric motor (12) and with a control stage (14) for the energy supply (16) to the electric motor (12), **characterized in that** during off-periods of the electric motor (12) the control stage (14) supplies the electric motor with an energy which is adapted in particular in terms of duration and/or amplitude and which the electric motor (12), when off and in its capacity as an electroacoustic transducer, emits at least in part in the form of audible signals.
2. The appliance (10) as claimed in claim 1, **characterized in that** the electric motor (12) is constructed as a low-duty motor comprising a rotor and a stator, for example, as a direct-current motor.
3. The appliance (10) as claimed in claim 1, **characterized in that** the electric motor (12) is constructed as an asynchronous, synchronous, stepping, reluctance motor or the like.
4. The appliance (10) as claimed in any one of the preceding claims, **characterized in that** the control stage (14) feeds analog signals to the electric motor (12).
5. The appliance (10) as claimed in claim 4, **characterized in that** the analog signal, for example a voltage signal, contains the spectrum of the audible signals emitted by the electric motor (12).
6. The appliance (10) as claimed in claim 4 or 5, **characterized in that** the analog signal contains frequency mixes, for example to generate audible speech or music signals.
7. The appliance (10) as claimed in any one of the preceding claims, **characterized in that** the analog signal is a unipolar signal (18).
8. The appliance (10) as claimed in any one of the claims 1 to 6, **characterized in that** the analog signal is a bipolar signal (20).
9. The appliance (10) as claimed in any one of the preceding claims 1 to 3, **characterized in that** the control stage (14) feeds digital signals to the electric motor (12).

10. The appliance (10) as claimed in claim 9, **characterized in that** the digital signals are pulse-duration-modulated signals (22) and have in particular an essentially constant maximum amplitude.

11. The appliance (10) as claimed in claim 9 or 10, **characterized in that** the fundamental frequency of the digital signal represents the pitch of the audible signal.

12. The appliance (10) as claimed in any one of the preceding claims, **characterized in that** the time average (24) of the signal (18, 20, 22) lies below a signal threshold value (26) that causes the electric motor (12) to start up.

13. The appliance (10) as claimed in claim 12, **characterized in that** the signal threshold value (26) varies in response to the signal frequency and in particular rises with the frequency.

14. The appliance (10) as claimed in any one of the preceding claims, **characterized in that** the signal (18, 20, 22) has no frequencies below a frequency threshold value that causes the electric motor (12) to start up.

15. The appliance (10) as claimed in any one of the preceding claims, **characterized in that** provision is made for a time delay between the instant the electric motor (12) is shut off as a driving mechanism and the instant the electric motor (12) is operated as an electroacoustic transducer.

16. The appliance (10) as claimed in any one of the preceding claims, **characterized in that** the electric motor (12) has a brake (28), for example a mechanical brake with a constant braking torque, or a start-up brake with a braking torque that decreases after the motor starts up.

17. The appliance (10) as claimed in any one of the preceding claims, **characterized in that** the electric motor (12) has a device (30) for positioning the rotor in a defined position of rest when off.

18. The appliance (10) as claimed in any one of the preceding claims, **characterized in that**, for optimization of the efficiency in terms of acoustic power output, the electric motor (12) is equipped with an accordingly adapted motor housing or motor housing material.

19. The appliance (10) as claimed in any one of the preceding claims, **characterized in that** provision is made for ribs, hard parts or similar mechanical elements (32) between the appliance (10) or appliance housing (34) and the electric motor (12) to optimize the acoustic emission of the appliance (10) or appliance housing (34).

20. The appliance (10) as claimed in any one of the preceding claims, **characterized in that** the control stage (14) is formed by a driving stage (36) that is connected to the energy supply (16) on the one side and to a signal generator (38) on the other side and, where applicable, to additional electronic components.

21. The appliance (10) as claimed in any one of the preceding claims, **characterized in that** it is constructed as a toothbrush, an oral irrigator, a shaver, a household machine or the like.